Application Serial No. 10/520,321
Reply to Office Action of April 28, 2009

PATENT
Docket: CU-6585

Amendments to the Claims

The listing of claims presented below replaces all prior versions, and listings, of claims in the application.

Listing of claims:

1. - 28.   (cancelled)

29.   (currently amended) A green pigment for a color filter which is comprised of a brominated zinc phthalocyanine green pigment containing less than 13 bromines on average per one molecule and capable of expressing a region of xy-chromaticity coordinate enclosed by the following Equations 7, 8 and 9 ~~1, 2 and 3~~ defined by the XYZ color system of the CIE when the green pigment is solely subjected to colorimetry using a F10 light source:

(Equation 7)

$y = 4.000Xx - 0.270$

wherein $0.210 < x < 0.220$

(Equation 8)

$y = 3849.200Xx^4 - 4595.600Xx^3 + 2056.300Xx^2 - 409.710Xx + 31.138$

wherein $0.220 < x < 0.350$

(Equation 9)

$y = 737462.022Xx^6 - 1267177.816Xx^5 + 904622.642Xx^4 - 343495.090Xx^3 + 73187.274Xx^2 - 8299.969Xx + 392.073$

wherein $0.210 < x < 0.350$

~~(Equation 1)~~

~~$y = 2.640 X x + 0.080$~~

~~wherein a range of "x" in the Equation 1 is 0.180<x<0.230~~

~~(Equation 2)~~

~~$y = 5261.500 X x^4 - 6338.700 X x^3 + 2870.400 X x^2 - 580.730 X x + 44.810$~~

~~wherein a range of "x" in the Equation 2 is 0.230<x<0.350~~

~~(Equation 3)~~

~~$y = -36.370 X x^3 + 37.410 X x^2 - 13.062 X x + 1.907$~~

~~wherein a range of "x" in the Equation 3 is 0.180<x<0.350.~~

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30.   (previously presented) The green pigment for a color filter according to Claim 29 wherein the phthalocyanine green pigment has a wavelength (Tmax) within a range of 500 to 520 nm at which a maximum transmittance in a spectrum of a spectral transmittance between 380 and 780 nm is provided.

31. – 32.   (cancelled)

33.   (currently amended) A green pigment dispersion for a color filter comprising the brominated zinc phthalocyanine according to Claim [[31]] 29 which has a mean primary particle size within 0.01 to 0.1 μm.

34.   (previously presented) A photosensitive color composition for a color filter comprising a reactive substance involving a curing reaction and one or more coloring substances including the green pigment for a color filter according to Claim 29.

35.   (previously presented) The photosensitive color composition for a color filter according to Claim 34 wherein the green pigment for a color filter is included at a proportion more than 30% by weight of the coloring substance.

36.   (previously presented) The photosensitive color composition for a color filter according to Claim 34 wherein the green pigment for a color filter is included at a proportion more than 50% by weight based on a total amount of green pigments in the coloring substance.

37.   (previously presented) A photosensitive color composition for a color filter comprising a reactive substance involving a curing reaction and a coloring substance including a first and a second green pigments, wherein the first green pigment is one selected from the group consisting of green pigments for a color filter each of which is comprised of a phthalocyanine green pigment and capable of expressing a region of xy-chromaticity coordinate enclosed by the following Equations 1, 2 and 3 defined by the XYZ color system of the CIE when the green pigment is solely subjected to colorimetry using a F10 light source, and wherein the second green pigment is one

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selected from the group consisting of green pigments for a color filter each of which is comprised of a phthalocyanine green pigment and capable of expressing a region of xy-chromaticity coordinate enclosed by the following Equations 4, 5 and 6 defined by the XYZ color system of the CIE when the green pigment is solely subjected to colorimetry using a F10 light source:

(Equation 1)

$$y = 2.640 \times x + 0.080$$

wherein a range of "x" in the Equation 1 is $0.180 < x < 0.230$

(Equation 2)

$$y = 5261.500 \times x^4 - 6338.700 \times x^3 + 2870.400 \times x^2 - 580.730 \times x + 44.810$$

wherein a range of "x" in the Equation 2 is $0.230 < x < 0.350$

(Equation 3)

$$y = -36.379 \times x^3 + 37.410 \times x^2 - 13.062 \times x + 1.907$$

wherein a range of "x" in the Equation 3 is $0.180 < x < 0.350$

(Equation 4)

$$y = 8.000 \times x - 1.513$$

wherein a range of "x" in the Equation 4 is $0.260 < x < 0.270$

(Equation 5)

$$y = -1051.300 \times x^4 + 1176.900 \times x^3 - 450.880 \times x^2 + 62.131 \times x - 0.836$$

wherein a range of "x" in the Equation 5 is $0.260 < x < 0.350$

(Equation 6)

$$y = 5746.700 \times x^4 - 7310.300 \times x^3 + 3493.200 \times x^2 - 744.610 \times x + 60.251$$

wherein a range of "x" in the Equation 6 is $0.270 < x < 0.350$.

38.   (previously presented) The photosensitive color composition for a color filter according to Claim 37 wherein the first green pigment has a wavelength (Tmax) within a range of 500 to 520 nm at which a maximum transmittance in a spectrum of a spectral transmittance between 380 and 780 nm is provided, and wherein the second green pigment has a wavelength (Tmax) within a range of 520 to 535 nm at which a maximum transmittance in a spectrum of a spectral transmittance between 380 and 780 nm is provided.

39.   (previously presented) The photosensitive color composition for a color filter

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according to Claim 37 wherein a central metal of the phthalocyanine green pigment in the first green pigment is the same as that in the second green pigment.

40.   (previously presented) The photosensitive color composition for a color filter according to Claim 37 wherein the first green pigment and the second green pigment are brominated zinc phthalocyanines.

41.   (previously presented) The photosensitive color composition for a color filter according to Claim 40 wherein the brominated zinc phthalocyanine of the first green pigment contains less than 13 bromines on average per one molecule, and wherein the brominated zinc phthalocyanine of the second green pigment contains 13 or more bromines on average per one molecule.

42.   (previously presented) The photosensitive color composition for a color filter according to Claim 40 wherein each of the brominated zinc phthalocyanines has a mean primary particle size within 0.01 to 0.1 μm.

43.   (previously presented) The photosensitive color composition for a color filter according to Claim 34 wherein a weight ratio (b/a) of a non reactive substance (b) other than the coloring substance to the reactive substance (a) is 0.45 or less.

44.   (previously presented) The photosensitive color composition for a color filter according to Claim 37 wherein a weight ratio (b/a) of a non reactive substance (b) other than the coloring substance to the reactive substance (a) is 0.45 or less.

45.   (previously presented) The photosensitive color composition for a color filter according to Claim 34 wherein a ratio expressed by pigment/vehicle is in a range of 0.25 to 1.0.

46.   (previously presented) The photosensitive color composition for a color filter according to Claim 37 wherein a ratio expressed by pigment/vehicle is in a range of 0.25 to 1.0.

47.   (previously presented) The photosensitive color composition for a color filter according to Claim 34 wherein at least one yellow pigment is further contained as the coloring substance.

48.   (previously presented) The photosensitive color composition for a color filter according to Claim 37 wherein at least one yellow pigment is further contained as the coloring substance.

49.   (currently amended) The photosensitive color composition for a color filter according to Claim [[34]] 47 wherein a green pigment including the green pigment for a color filter and the yellow pigment are contained at 1.6 or less in a weight ratio (yellow pigment/green pigment) of the yellow pigment to the green pigment.

50.   (currently amended) The photosensitive color composition for a color filter according to Claim [[37]] 48 wherein a green pigment including the green pigment for a color filter and the yellow pigment are contained at 1.6 or less in a weight ratio (yellow pigment/green pigment) of the yellow pigment to the green pigment.

51.   (previously presented) A color filter provided with a green pixel comprising one or more pigments including the green pigment for a color filter according to Claim 29.

52.   (previously presented) A color filter provided with a green pixel which is formed using the photosensitive color composition for a color filter according to Claim 34.

53.   (previously presented) A color filter provided with a green pixel which is formed using the photosensitive color composition for a color filter according to Claim 37.

54.   (previously presented) The color filter according to Claim 51 wherein the green pixel has a thickness of 2.7 μm or less and is capable of expressing a color space ranging $0.21 \leq x \leq 0.30$ in a x-coordinate, $0.55 \leq y \leq 0.71$ in a y-coordinate and

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$29 \leq Y$ in a stimulus value "Y" defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

55.   (previously presented) The color filter according to Claim 52 wherein the green pixel has a thickness of 2.7 μm or less and is capable of expressing a color space ranging $0.21 \leq x \leq 0.30$ in a x-coordinate, $0.55 \leq y \leq 0.71$ in a y-coordinate and $29 \leq Y$ in a stimulus value "Y" defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

56.   (previously presented) The color filter according to Claim 53 wherein the green pixel has a thickness of 2.7 μm or less and is capable of expressing a color space ranging $0.21 \leq x \leq 0.30$ in a x-coordinate, $0.55 \leq y \leq 0.71$ in a y-coordinate and $29 \leq Y$ in a stimulus value "Y" defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

57.   (previously presented) The color filter according to Claim 51 wherein the green pixel comprising the green pigment for a color filter further contains at least a yellow pigment at 1.6 or less in a weight ratio (yellow pigment/green pigment) of the yellow pigment to the green pigment for a color filter, and is capable of expressing a region of xy-chromaticity coordinate ranging $0.21 \leq x \leq 0.30$ in a x-coordinate and $0.55 \leq y \leq 0.71$ in a y-coordinate defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

58.   (previously presented) The color filter according to Claim 52 wherein the green pixel comprising the green pigment for a color filter further contains at least a yellow pigment at 1.6 or less in a weight ratio (yellow pigment/green pigment) of the yellow pigment to the green pigment for a color filter, and is capable of expressing a region of xy-chromaticity coordinate ranging $0.21 \leq x \leq 0.30$ in a x-coordinate and $0.55 \leq y \leq 0.71$ in a y-coordinate defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

59.   (previously presented) The color filter according to Claim 53 wherein the green pixel comprising the green pigment for a color filter further contains at least a

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yellow pigment at 1.6 or less in a weight ratio (yellow figment/green pigment) of the yellow pigment to the green pigment for a color filter, and is capable of expressing a region of xy-chromaticity coordinate ranging $0.21 \leq x \leq 0.30$ in a x-coordinate and $0.55 \leq y \leq 0.71$ in a y-coordinate defined by the XYZ color system of the CIE when the green pixel is solely subjected to colorimetry using a F10 light source.

60.   (previously presented) A color filter provided with a green pixel which is formed using a photosensitive color composition for a color filter comprising a reactive substance involving a curing reaction and a coloring substance including a first and a second green pigments, wherein the first green pigment is one selected from the group consisting of green pigments for a color filter each of which is comprised of a phthalocyanine green pigment and capable of expressing a region of xy-chromaticity coordinate enclosed by the following Equations 1, 2 and 3 defined by the XYZ color system of the CIE when the green pigment is solely subjected to colorimetry using a F10 light source, and wherein the second green pigment is one selected from the group consisting of green pigments for a color filter each of which is comprised of a phthalocyanine green pigment and capable of expressing a region of xy-chromaticity coordinate enclosed by the following Equations 4, 5 and 6 defined by the XYZ color system of the CIE when the green pigment is solely subjected to colorimetry using a F10 light source:

(Equation 1)

$y = 2.640 \times x + 0.080$

wherein a range of "x" in the Equation 1 is $0.180 < x < 0.230$

(Equation 2)

$y = 5261.500 \times x^4 - 6338.700 \times x^3 + 2870.400 \times x^2 - 580.730 \times x + 44.810$

wherein a range of "x" in the Equation 2 is $0.230 < x < 0.350$

(Equation 3)

$y = -36.379 \times x^3 + 37.410 \times x^2 - 13.062 \times x + 1.907$

wherein a range of "x" in the Equation 3 is $0.180 < x < 0.350$

(Equation 4)

$y = 8.000 \times x - 1.513$

wherein a range of "x" in the Equation 4 is $0.260 < x < 0.270$

(Equation 5)

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$$y = -1051.300 \times x^4 + 1176.900 \times x^3 - 450.880 \times x^2 + 62.131 \times x - 0.836$$

wherein a range of "x" in the Equation 5 is $0.260 < x < 0.350$

(Equation 6)

$$y = 5746.700 \times x^4 - 7310.300 \times x^3 + 3493.200 \times x^2 - 744.610 \times x + 60.251$$

wherein a range of "x" in the Equation 6 is $0.270 < x < 0.350$.

61.   (previously presented) The color filter according to Claim 60 wherein the green pixel has a thickness of 2.5 μm or less and is capable of expressing a color space ranging $0.25 \le x \le 0.32$ in a x-coordinate, $0.55 \le y \le 0.75$ in a y-coordinate and $30 \le Y$ in a stimulus value "Y" defined by the XYZ color system of the CIE.

62.   (previously presented) The color filter according to Claim 60 wherein the green pixel contains a green pigment including the first and the second green pigments and a yellow pigment at 1.6 or less in a weight ratio (yellow pigment/green pigment) of the yellow pigment to the green pigment, and is capable of expressing a region of xy-chromaticity coordinate ranging $0.25 \le x \le 0.32$ in a x-coordinate and $0.55 \le y \le 0.75$ in a y-coordinate defined by the XYZ color system of the CE when the green pixel is solely subjected to colorimetry using a F10 light source.

63.   (previously presented) The color filter according to Claim 51 wherein the green pixel has 500 N/mm^2 or more of hardness or 20% or more of elastic deformation.

64.   (previously presented) The color filter according to Claim 52 wherein the green pixel has 500 N/mm^2 or more of hardness or 20% or more of elastic deformation.

65.   (previously presented) The color filter according to Claim 53 wherein the green pixel has 500 N/mm^2 or more of hardness or 20% or more of elastic deformation.

66.   (previously presented) The color filter according to Claim 60 wherein the green pixel has 500 N/mm^2 or more of hardness or 20% or more of elastic

deformation.

67.   (previously presented) The color filter according to Claim 51 wherein a section obtained from the green pixel has an upper edge and a bottom edge with a ratio in length of an upper edge to a bottom edge being less than 1.

68.   (previously presented) The color filter according to Claim 52 wherein a section obtained from the green pixel has an upper edge and a bottom edge with a ratio in length of an upper edge to a bottom edge being less than 1.

69.   (previously presented) The color filter according to Claim 53 wherein a section obtained from the green pixel has an upper edge and a bottom edge with a ratio in length of an upper edge to a bottom edge being less than 1.

70.   (previously presented) The color filter according to Claim 60 wherein a section obtained from the green pixel has an upper edge and a bottom edge with a ratio in length of an upper edge to a bottom edge being less than 1.

71.   (previously presented) A liquid crystal panel wherein the color filter according to Claim 51 and a substrate as a side driving liquid crystal is disposed by facing them to each other, and a liquid crystal is sealed in a gap between them.

72.   (previously presented) A liquid crystal panel wherein the color filter according to Claim 52 and a substrate as a side driving liquid crystal is disposed by facing them to each other, and a liquid crystal is sealed in a gap between them.

73.   (previously presented) A liquid crystal panel wherein the color filter according to Claim 53 and a substrate as a side driving liquid crystal is disposed by facing them to each other, and a liquid crystal is sealed in a gap between them.

74.   (previously presented) A liquid crystal panel wherein the color filter according to Claim 60 and a substrate as a side driving liquid crystal is disposed by facing them to each other, and a liquid crystal is sealed in a gap between them.